

TIP: After subtraction is written in terms of addition, the rules of addition are applied.

Example 2 Adding and Subtracting Several Integers

Simplify. $-4 - 6 + (-3) - 5 + 8$

Solution:

$$\begin{aligned} & -4 - 6 + (-3) - 5 + 8 \\ &= \underbrace{-4 + (-6)} + (-3) + (-5) + 8 && \text{Rewrite all subtractions in terms of addition.} \\ &= \underbrace{-10 + (-3)} + (-5) + 8 && \text{Add from left to right.} \\ &= \underbrace{-13 + (-5)} + 8 \\ &= \underbrace{-18 + 8} \\ &= -10 \end{aligned}$$

Skill Practice

Simplify.
8. $-8 - 10 + (-6) - (-1) + 4$

Classroom Example: p. 103, Exercise 42

2. Translations and Applications of Subtraction

Recall from Section 1.3 that several key words imply subtraction.

Word/Phrase	Example	In Symbols
a minus b	-15 minus 10	$-15 - 10$
The difference of a and b	The difference of 10 and -2	$10 - (-2)$
a decreased by b	9 decreased by 1	$9 - 1$
a less than b	-12 less than 5	$5 - (-12)$
Subtract a from b	Subtract -3 from 8	$8 - (-3)$
b subtracted from a	-2 subtracted from -10	$-10 - (-2)$

Example 3 Translating to a Mathematical Expression

Translate to a mathematical expression. Then simplify.

a. The difference of -52 and 10 .

b. -35 decreased by -6 .

Solution:

a. the difference of
 $-52 - 10$ Translate: The difference of -52 and 10 .
 $= -52 + (-10)$ Rewrite subtraction in terms of addition.
 $= -62$ Add.

b. decreased by
 $-35 - (-6)$ Translate: -35 decreased by -6 .
 $= -35 + (6)$ Rewrite subtraction in terms of addition.
 $= -29$ Add.

Skill Practice

Translate to a mathematical expression. Then simplify.
9. The difference of -16 and 4
10. -8 decreased by -9

Classroom Examples: p. 103, Exercises 52 and 54

Avoiding Mistakes

Subtraction is not commutative. The order of the numbers being subtracted is important.

Answers
8. -19 9. $-16 - 4; -20$
10. $-8 - (-9); 1$

Skill Practice

Translate to a mathematical expression. Then simplify.
11. 6 less than 2
12. Subtract -4 from -1 .

Classroom Examples: pp. 103–104, Exercises 56 and 58

Example 4 Translating to a Mathematical Expression

Translate each English phrase to a mathematical expression. Then simplify.

a. 12 less than -8

b. Subtract 27 from 5.

Solution:

a. To translate “12 less than -8 ,” we must start with -8 and subtract 12.
 $-8 - 12$ Translate: 12 less than -8 .
 $= -8 + (-12)$ Rewrite subtraction in terms of addition.
 $= -20$ Add.

b. To translate “subtract 27 from 5,” we must start with 5 and subtract 27.

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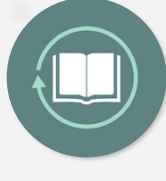
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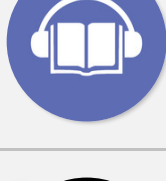
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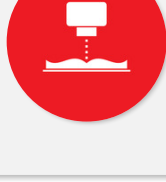
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